REMARKS

By this Amendment, Applicant cancels previously withdrawn claims 1-5 and 10-15 without prejudice or disclaimer; amends claims 6 and 7; and adds new claims 16-29. Claims 6-9 and 16-29 are now pending.

In the Office Action[1], the Examiner rejected claims 6-9 under 35 U.S.C. § 112, second paragraph (Office Action, pg 2), and rejected claims 6-9 under 35 U.S.C. § 103(a) as being unpatentable in view of disclosure in the Background Section of the present application including the reference to ISO 5347-1:1993[2] (hereinafter "Background") (Office Action, pg 2)

Applicant respectfully traverses these rejections for the following reasons.

AMENDMENTS TO CLAIMS 6 AND 7 AND NEW CLAIMS 16-29

Support for the claim amendments and new claims may be found at the specification and figures as originally filed, including the specification at pgs. 30, 31, and 33; and Figs. 4A, 5-7, and 20. Reference to the specification and figures are exemplary in nature and in no way are intended to limit the scope of the protection as claimed.

THE PENDING CLAIMS FULFILL THE REQUIREMENTS OF 35 U.S.C. § 112

In the Office Action, the Examiner rejected claims 6-9 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant

[1] The Final Office Action may contain a number of statements reflecting characterizations of the related art and the claims. Regardless of whether any such statement is identified herein, Applicant declines to automatically subscribe to any statement or characterization in the Office Action.

[2] Page 2 of the Office Action incorrectly refers to ISO 5347-11:1993 as ISO 5247-11:1993. In order to advance prosecution Applicant assumes that the Office Action was referring to ISO 5347-11:1993 and requests clarification if the assumption is incorrect.

regards as the invention. Applicant respectfully traverses these rejections. However, in order to advance prosecution Applicant amends claims 6 and 7 to recite a "sensor which is fixed, via a jig, on a uniaxial vibration generator for generating rotational vibration motion, and which detects acceleration based on said rotational vibration motion," therefore, even more clearly claiming the subject matter which applicant regards as the invention.

Specifically, Applicant asserts that one of ordinary skill in the art, in view of the specification, would understand with clarity and precision that the claimed features, such as, a "sensor which . . . detects acceleration based on said rotational vibration motion," would mean, for example, that the sensor is used to detect acceleration based on rotational vibration motion generated by an uniaxial vibration generator. See specification at pgs. 30 and 31.

For at least the foregoing reasons, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 7-9 under 35 U.S.C. §112, second paragraph.

CLAIMS 6-9 ARE ALLOWABLE IN VIEW OF BACKGROUND

The Examiner rejected claims 6-9 under 35 U.S.C. § 103(a) as being unpatentable over "Applicant's Statement." (Office Action, pg. 2). To establish a *prima facie* case of obviousness, the Examiner must ascertain the differences between the claimed invention and the prior art. (*See* M.P.E.P. § 2141(II)(A)). "The Federal Circuit has stated that the 'rejections on obviousness cannot be sustained with mere conclusory statements; instead there must be some articulated reasoning with some

rational underpinning to support the legal conclusion of obviousness.'" (M.P.E.P. § 2142).

Independent claim 6, recites a method comprising, among other steps:

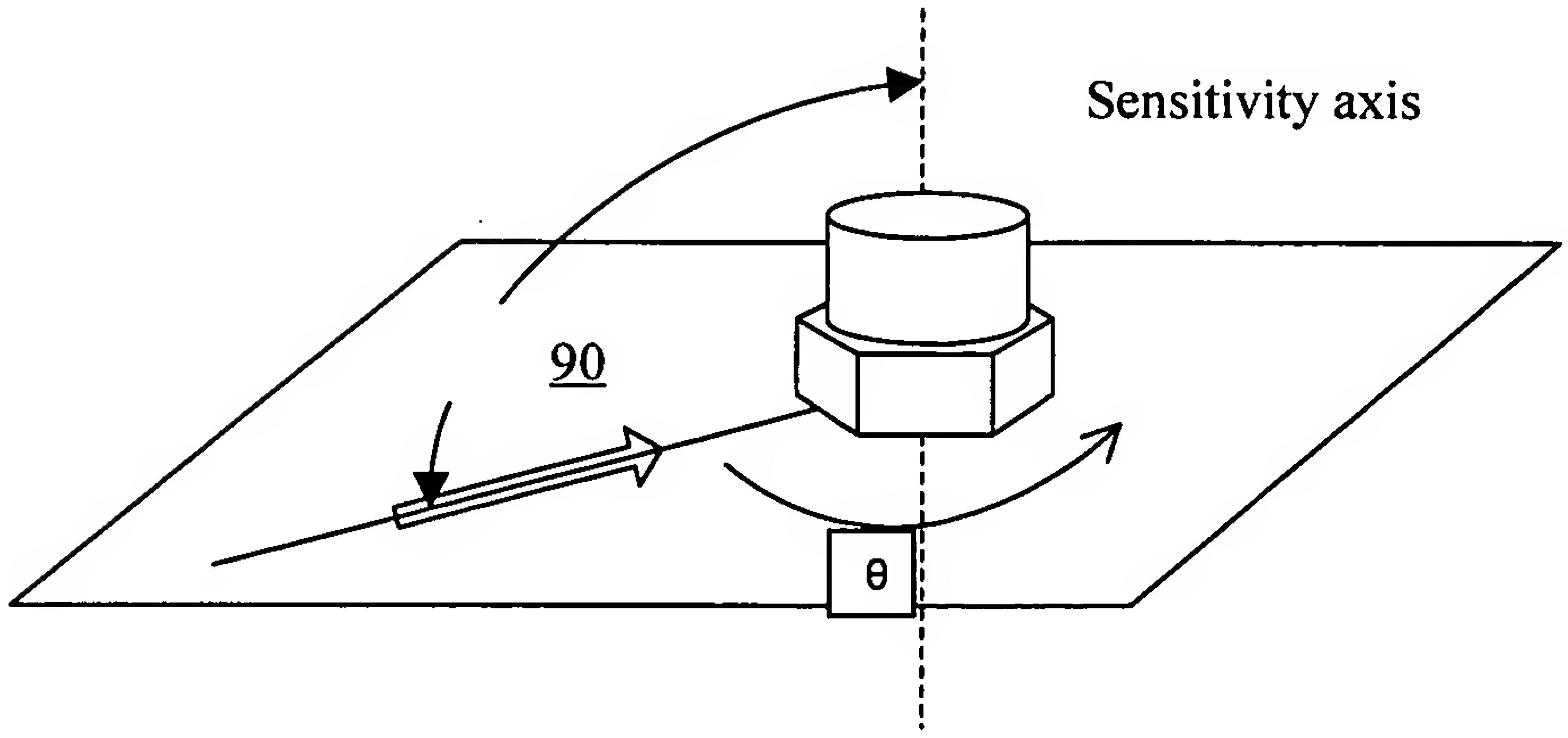
> **generating a sensitivity matrix based on the transverse sensitivity,** the calculated transverse sensitivity being an element of the sensitivity matrix,
>
> wherein the application is carried out in a state in which a coordinate axis of a coordinate system of a space defining the input acceleration to said sensor **is aligned with a direction of a rotational axis of the vibration by adjusting said jig, the coordinate axis corresponding to a sensing axis of said sensor**.

(Emphases added). Background does not teach or suggest at least these features of claim 6, and does not render claim 6 obvious.

Page 5, lines 8-20 of Background disclose:

> On a plane **normal to the sensing axis** of the acceleration sensor 1 for detecting the translational acceleration, vibration acceleration A sin ωt is applied (indicated by the arrow 4 in FIG. 2). Normalizing the obtained sensitivity by the main axis sensitivity gives the transverse sensitivity. According to the ISO standard, **the transverse sensitivity is obtained with varying, an angle θ (the angle between the direction of the vibration acceleration 4 and a marking 5 put to the reference position of the acceleration sensor 1 on the plane normal to the sensing axis of the acceleration sensor 1**). Then it instructs to report the transverse sensitivity value and angle θ_{man} when the maximum value is obtained, and the transverse sensitivity value and angle θ_{min} when the minimum value is obtained.

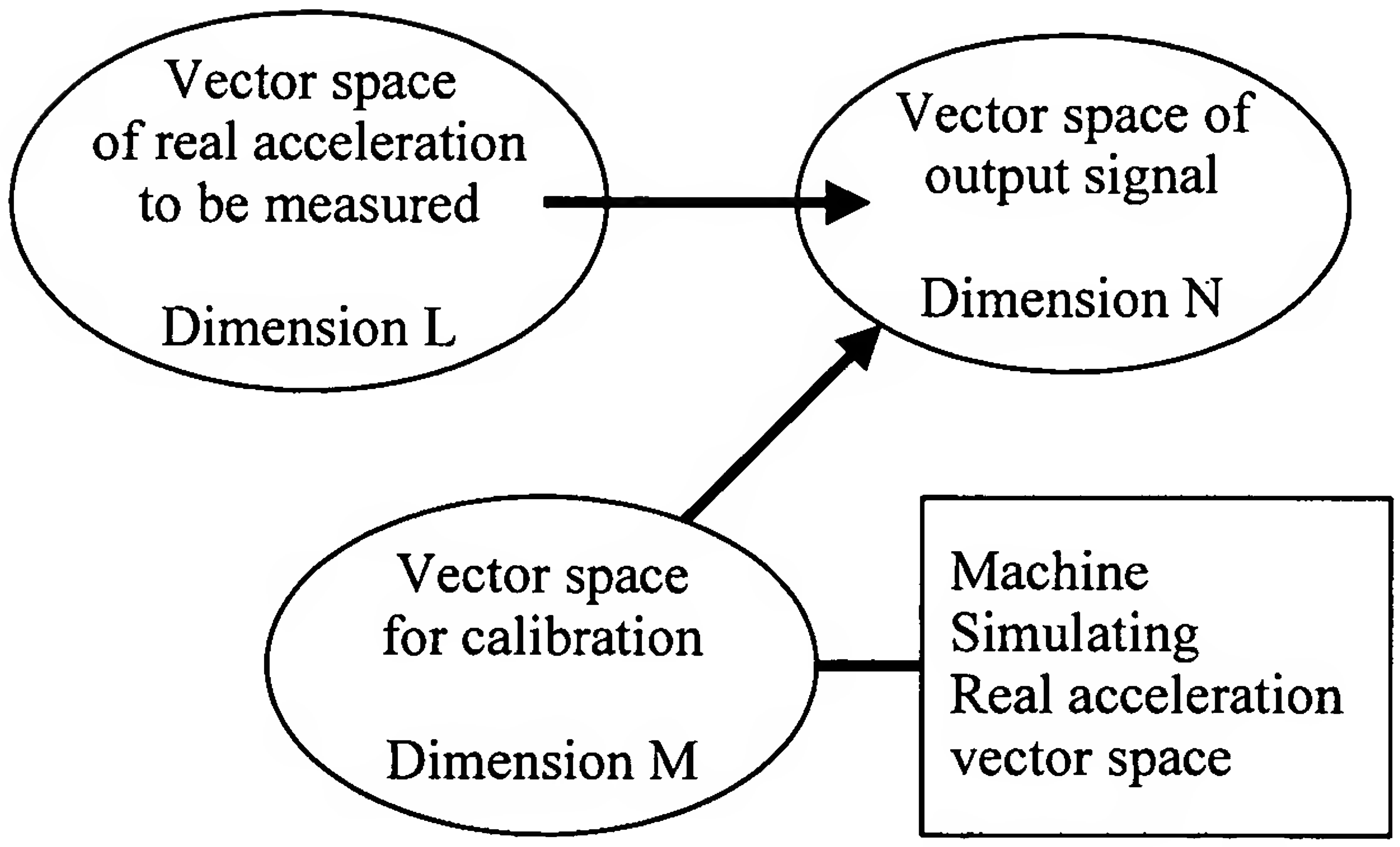
The above passage of in the background is explained with reference to FIG. 2 of the instant application which is similar to the Figure illustrated below:



As disclosed in Background and illustrated above transverse sensitivity is obtained by applying vibration acceleration A sin ωt on a plane normal to the sensing axis of the acceleration sensor 1 and by varying an angle θ. Thus, the method for measuring transverse sensitivity described in ISO5347 describes obtaining traverse sensitivity by applying vibration acceleration or impact acceleration to an accelerometer on a plane normal to a sensitivity axis of the uniaxial accelerometer. Output values of the uniaxial accelerometer are obtained by varying angle θ until a maximum output value and a minimum output value is obtained. These maximum and minimum values are used to determine the transverse sensitivity. See specification page 5, lines 17-22.

Such a disclosure, however, does not constitute "generating **a sensitivity matrix** based on the transverse sensitivity, the calculated transverse sensitivity being an element of the sensitivity matrix," (emphasis added) as recited in claim 6. This is because Background and ISO 5347-1:1993 are silent with respect to the claimed "sensitivity matrix."

As is illustrated in FIGS. 20, 21, and 22 of the original specification and the Figure below, the claimed "sensitivity matrix" is obtained by mapping a set of vectors representing accelerations in various directions into signal vector space.



The vector space of real acceleration is a set of elements representing acceleration vectors to be measured and the vector space of calibration is a set of acceleration vectors to be measured by an accelerometer used for calibrating the accelerometer, while the term "space" is used in the specification to refer to a set of elements. See specification at page 12.

The role of the accelerometer is to map the vectors of calibration or real acceleration into the vector space of output signal as indicated in the Figure above. A sensitivity matrix is generated by applying acceleration in different directions and then calculating transverse sensitivity for each application. In case of an uniaxial acceleration sensor illustrated in Fig. 20 (copied below) of the specification, a sensitivity matrix (S_{zz} S_{zx} S_{zy}) will be generated, where each entry in the sensitivity matrix is a transverse sensitivity based on application of acceleration in a particular direction.

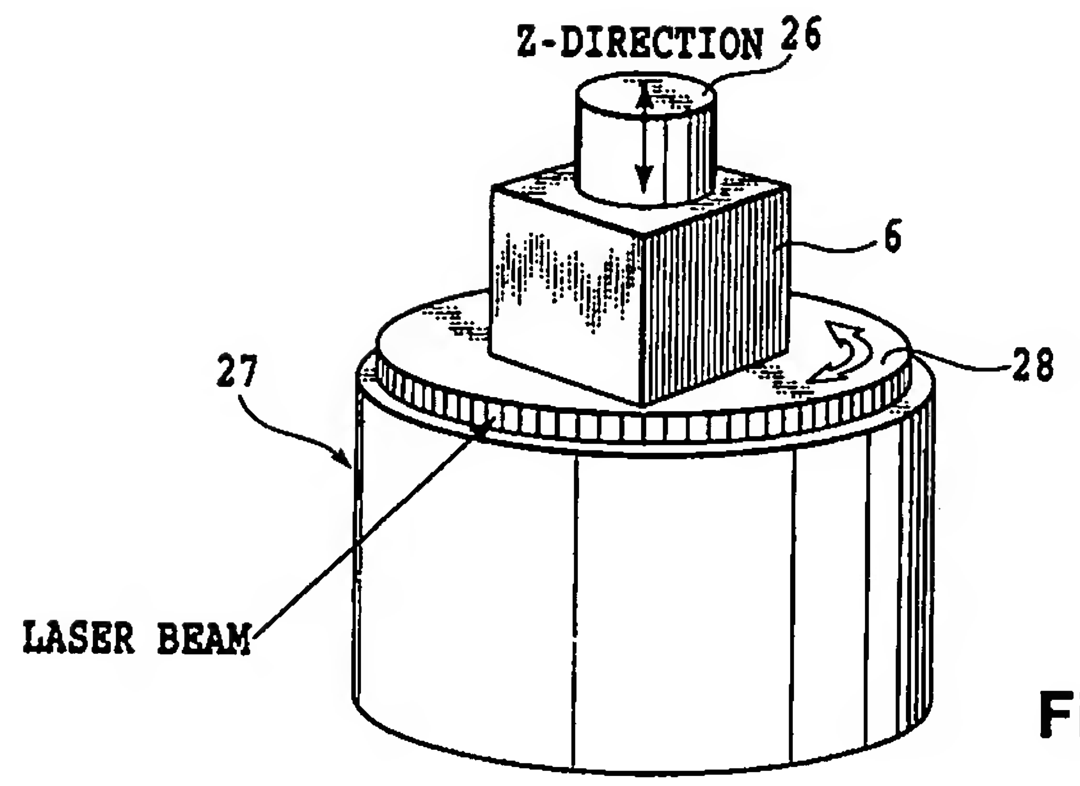


Fig. 20

For example, in the arrangement above cubical block 6 and uniaxial acceleration sensor 26 are shaken in the direction of the Z-axis due to vibration of uniaxial vibration generator 27 in the z-direction. Input acceleration due to the shaking of uniaxial vibration generator 27 is applied in the z-direction. Due to the application of input acceleration in the z-direction the Z-axis is referred to as the coordinate axis defining the direction in which the input acceleration is applied. The input acceleration applied along the coordinate axis causes disk-shaped table 28 to carry out rotational vibration in the direction of the rotational axis shown by the double circular arrow in Fig. 20. Such an arrangement causes the output axis, which is the sensing axis of uniaxial acceleration sensor 26, to also be in the Z-direction. Thus, transverse sensitivity S_{zz} is calculated by determining the ratio between Z-axis output and the Z-axis input. Further, the arrangement of cubical block 6 and the uniaxial acceleration sensor 26 is changed as illustrated in Figure 21 (copied below) of the specification, to apply input acceleration in the X-axis direction and to measure transverse sensitivity S_{zx}.

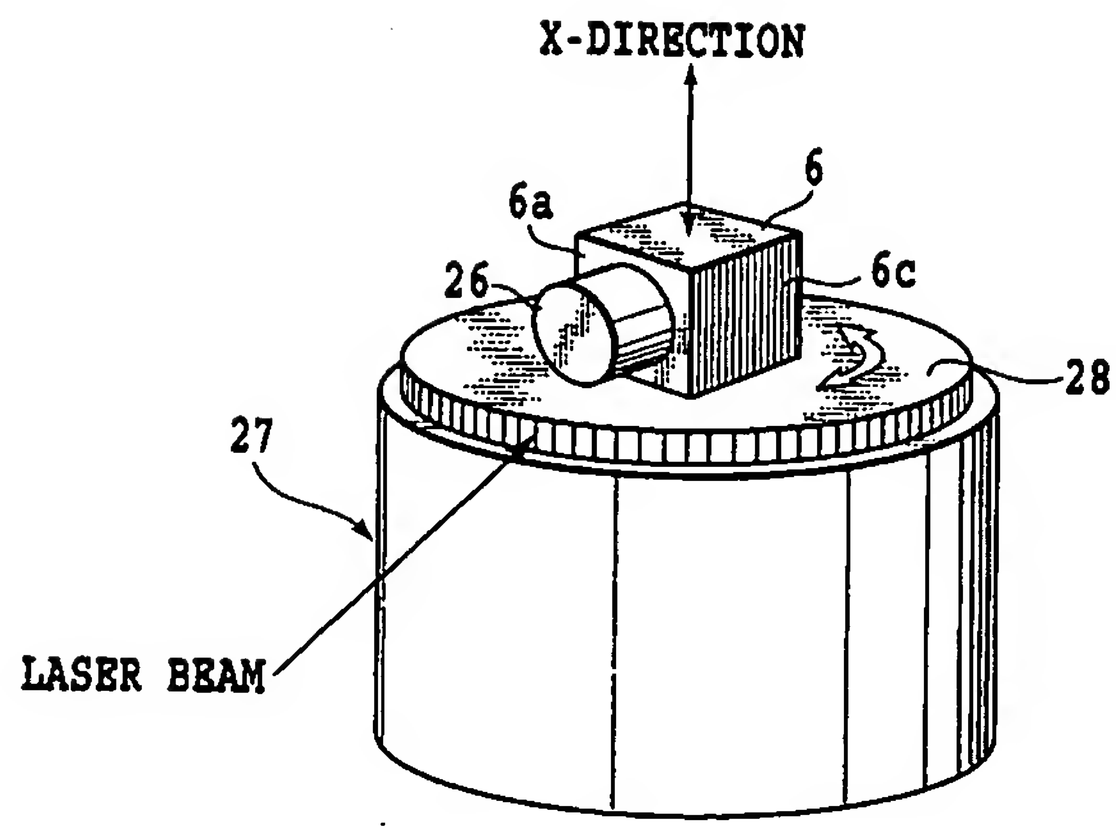


Fig. 21

Similarly, the arrangement of cubical block 6 and the uniaxial acceleration sensor 26 is changed again as illustrated in Figure 22 of the specification, to apply input acceleration in the Y-axis direction and to measure transverse sensitivity S_{zy}. Thus, "generating a **sensitivity matrix** [(S_{zz} S_{zx} S_{zy})] based on the transverse sensitivity, the calculated transverse sensitivity being an element of the sensitivity matrix," (emphasis added) as recited in claim 6. Such a result could not be achieved by using techniques disclosed in Background and ISO 5347-1:1993.

On page 2 of the Office Action the Examiner appears to concede this difference between Background and ISO 5347-1:1993, and claim 6 by stating "[f]igure 2 (and page 5) do not state that how the sensor 1 is connected to the source of vibration, and do not refer to a matrix," and instead concludes that "it would have been obvious to calculate transverse sensitivity of one of the elements of a matrix as Applicant describes (p. 14, line 13, to P. 15, line 22) calculating sensitivity of elements of a matrix for subsequent usage." Office Action, page 3. However, such a conclusory statement is incorrect because rejections of obviousness cannot be sustained with mere conclusory statements; instead there must be some articulated reasoning with some rational

underpinning to support the legal conclusion of obviousness. (See M.P.E.P. § 2142). Therefore, the rejection of claim 6 is improper for at least these reasons.

Moreover, Background and ISO 5347-1:1993 do not teach or suggest the method of claim 6 where the application of vibration acceleration "is carried out in a state in which a coordinate axis of a coordinate system of a space defining the input acceleration to said sensor is aligned with a direction of a rotational axis of the vibration by adjusting said jig, **the coordinate axis corresponding to a sensing axis of said sensor**," (emphasis added) as recited in claim 6.

The Office Action provides no rational underpinning to support the modification of Background and ISO 5347-1:1993 to conclude that claim 6 is obvious. Therefore, the Examiner is respectfully requested to withdraw the rejection of claim 6 under 35 U.S.C. § 103(a) for at least these reasons. Independent claim 7, although different in scope from claim 6, includes features similar to those discussed above with respect to claim 6. Accordingly, for at least the reasons given above, the rejection of claim 7 under 35 U.S.C. § 103(a) should be withdrawn. Claims 8 and 9 depend from one of claims 6 and 7 and are allowable at least by virtue of their dependence from allowable base claims.

Additionally, the rejections of claims 8 and 9 are also improper because the Examiner rejects them in view of conclusory statements. Office Action, page 3.

Accordingly, claims 6-9 are allowable over Background and ISO 5347-1:1993.

NEW CLAIMS 16-29 ARE ALLOWABLE OVER BACKGROUND

New independent claim 24, although different in scope from claim 6, includes features similar to those discussed above with respect to claim 6. Accordingly, for at least the reasons given above, claim 24 is also allowable over Background and ISO

5347-1:1993. Further, claims 16-23 and 25-28 are also allowable based on their dependency on one of independent claims 6, 7, and 24, and further due to the features recited therein.

THE PENDING CLAIMS ARE ALLOWABLE OVER U.S. PATENT APPLICATION PUBLICATION NO. 2005/0257616 TO KOZLOV ET AL.

A three-axis accelerometer can be configured by applying Figs. 24, 25, 35, 36, and 37 of Kozlov et al. The result obtained by measuring transverse sensitivity is not shown in the figures of Kozlov et al. and it is unclear how transverse sensitivity is defined in Kozlov et al. The term "transverse sensitivity" is not included in Kozlov et al. Accordingly, the transverse sensitivity in Kozlov et al. can be deemed as those defined in ISO5347 part 11.

Again, if the sensitivity matrix as set forth in the present invention is considered in Kozlov et al., there must be some key words (e.g., matrix, transverse sensitivity, matrix equation, linear independency) for representing the sensitivity matrix in the application of Kozlov et al. Since there are no such terms, Kozlov et al. is deemed to be considered based on the ISO standard.

Accordingly, the pending claims are allowable over Kozlov et al. because as is acknowledged on page 3 of the Office Action, "Kozlov et al. clearly does not employ the claimed orientations" and does not teach or suggest "calculating transverse sensitivity."

ADDITIONAL COMMENTS

For further details, please refer to the following documents and comments from the Applicant. Copies of these documents were enclosed with the Information Disclosure Statement filed August 17, 2007.

(1) ISO standards 16063 and 5347 show many standards relating to an accelerometer but all the accelerometers described in the standards are uniaxial accelerometers and there is no description indicating that defining sensitivity by matrix is mathematically appropriate. However representation of transverse sensitivity as non-diagonal element in the sensitivity matrix of the present invention allows the transverse sensitivity detected by multi-axis accelerometers to be defined. Existing ISO standards cannot handle the transverse sensitivity detected by multi-axis accelerometers because the existing standards do not use a representation of transverse sensitivity as a non-diagonal element in the sensitivity matrix. This is a clear difference between the ISO standards and the present invention described in the pending claims of this case.

(2) ISO/TC108/SC3. The chairman of ISO/TC108/SC3/WG6 is now a manager of a famous accelerometer maker (Bruel & Kjaer), and members of ISO/TC108/SC3/WG6 are supervisors of acceleration standards of standard institutes in various countries. In setting the above standards the members of ISO/TC108/SC3/WG6 are cooperating with an advisory committee called CCAUV (Consultative Committee for Acoustics, Ultrasound and Vibration) and are working under the "Convention of Meter." Members of CCAUV are supervisors of acceleration standards of standard institutes of various countries. Therefore, the above standard has the authority under the "Convention of Meter." (See ISO Homepage, BIPM Homepage for your review).

(3) Many countries have research institutes for standard measurement for maintaining/managing high-accuracy metrological standard and providing high-accuracy standards. These institutes include, for example, NIST in the United States, PTB in Germany, NPL in the United Kingdom, and NMIJ in Japan. Acceleration standards

provided in various countries, by these research institutes, are based on the above ISO standards 16063, 5347.

(4) The standard institutes of various countries conduct a worldwide round robin experiment according to ISO standards 16063, 5347 and show equivalence of measurements. In particular, if traceable to a NIST acceleration standard, it is also considered traceable to a PTB acceleration standard.

(5) However, in the method for applying acceleration in the axial direction of the uniaxial accelerometer the direction of the acceleration is known and the fact that the acceleration is physically a vector is disregarded. This is described in the beginning of the present application.

(6) Under the above circumstances, it is difficult to establish obviousness of the present invention in which an inverse matrix of the sensitivity matrix should be multiplied to obtain the real acceleration from the measured acceleration as the signal despite the fact that it is mathematically obvious.

(7) Meanwhile, the "Convention of Meter" is a system established by raising funds from governments of the member countries and is a worldwide network dominated by government bureaucracies. Once determined by the network, it is beyond the control of industrial sectors (private sectors).

(8) In the industrial sectors, the use of a multi-axial semiconductor accelerator has been increasing by production of 20% to 30% every year. However, the accuracy of measurement is indefinite due to the above circumstances.

Therefore, the present invention is not obvious.

CONCLUSION

In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: February 17, 2009

By: /John M. Romary/SS3
John M. Romary
Reg. No. 26,331

1784730v1